THE NEOLITHIC SETTLEMENT AT OLYNTHUS

BY

GEORGE E. MYLONAS

A Dissertation

SUBMITTED TO THE BOARD OF UNIVERSITY STUDIES OF THE JOHNS HOPKINS UNIVERSITY IN CONFORMITY WITH THE REQUIREMENTS FOR THE DEGREE OF DOCTOR OF PHILOSOPHY

(Extract from a complete illustrated volume published by the Johns Hopkins Press.)

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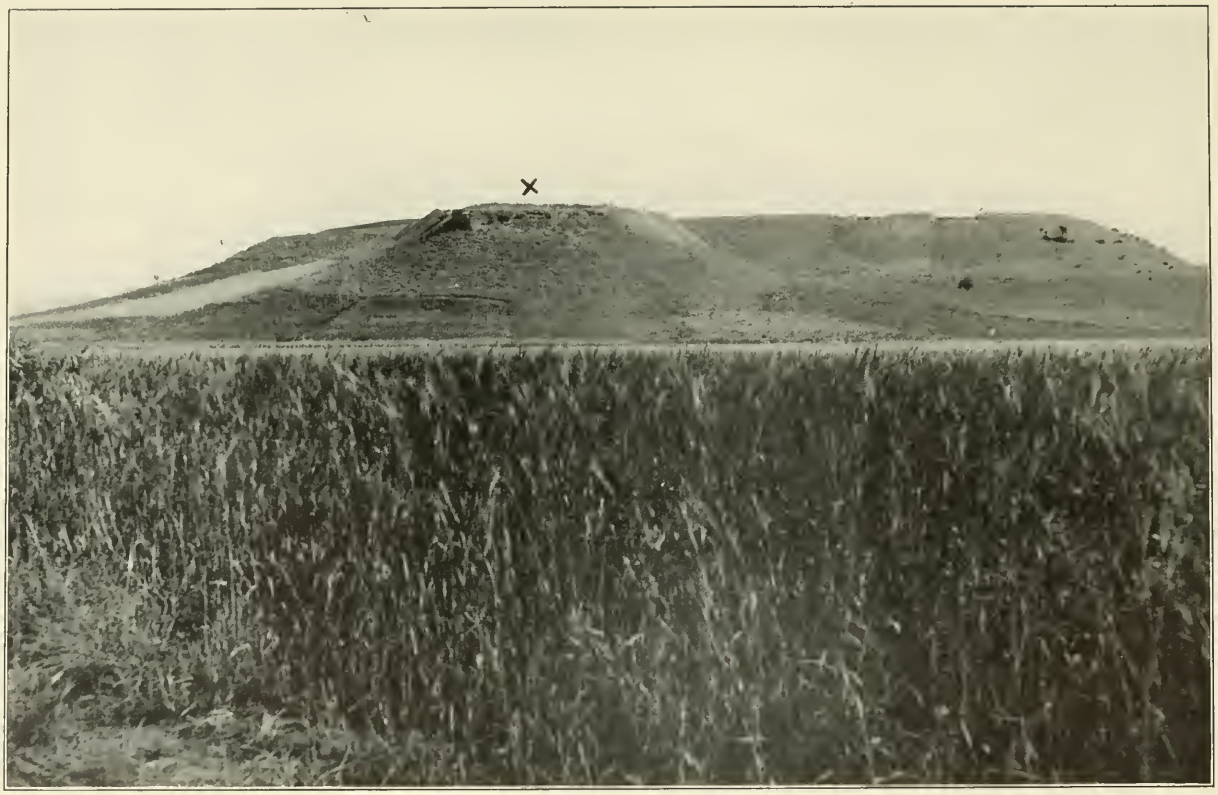


FIG. 1. The southern projection of the Megali Toumba from the south. The letter "x" marks the Neolithic Settlement.

Fig. 2. The southern projection of the Megali Toumba from the southeast.

CHAPTER I

THE SITE

A. THE SETTLEMENT

Remains found by Professor David M. Robinson all over the flat hill, near the small village Myriophyto, now known under the name Megali Toumba, on which the ruins of classical Olynthus were discovered,[1] indicated that at least part of this hill was occupied during the Stone Age when the use of metals was unknown and stone was employed for making tools and weapons. The neolithic finds excavated by Professor Robinson were more abundant at the southern end of the ancient site, where the hill projecting to the south forms a smaller hill connected with it by a narrow neck (Figs. 1-2). This second hill rises above the plain towards the sea and its bare higher part to the south, formed of conglomerate, looks from a distance like an artificial tower. Its sides slope sharply to the plain on the east and southeast and to the river, called in ancient days Olynthiacus or Sandanus [2] but today Retsinikia, on the west and southwest. The abundance of finds discovered in this section proves that this smaller hill was the center of the Stone Age settlement of Olynthus. The site was most appropriate for habitation, situated near a copious stream and surrounded by fields, which gave abundance of pasture and arable land, all that an agricultural and pastoral primitive population would desire. The preference of a hilly site at a time when settlements were built on the plain or on small artificial mounds [3] can be explained by the fact that to the north of the inhabited area the main part of the hill was large enough to provide pasture and arable land. That the neolithic settlers used the rest of the hill is proved by the many celts, which were discovered all over the area.

[1] Cf. David M. Robinson, in *A.J.A.*, XXXIII, 1929, pp. 53-76.

[2] Athenaeus, 334e; Plutarch, *Parallela*, 8.

[3] Cf. Tsountas, Αἱ *προϊστορικαὶ ἀκροπόλεις Διμηνίου καὶ Σέσκλου*, Athens, 1908, hereafter to be referred to as Tsountas, pp. 17-22.

Unfortunately this Stone Age settlement was not protected by the accumulation, which piled up over its ruined houses and formed a small rounded mound with gentle slopes. Its commanding position, although exposed to the strong winds from sea and mountains, was too good to be left unmolested. In classical times houses were built on its eastern side, while a big tower was built in Byzantine times directly over the settlement (Fig. 3). The foundations of the houses and those of the tower reached down to the natural rock, because the filling that formed the surface of the knoll was too soft. Thus the stratification of the prehistoric levels was destroyed at places. No buildings of great dimensions, however, were built over the southwestern side and edge of the mound and here the prehistoric remains were left undisturbed.

In the southwestern section of the mound not only pottery, celts and other smaller finds were discovered, but walls of houses, proving beyond doubt the existence of the settlement. It is not strange that a little over half a mile to the south another settlement, that of Agios Mamas, was found dating back to the Stone Age. The prehistoric tribes, wandering from place to place in search of suitable lands, would break up into small companies, perhaps into families, and establish themselves in settlements very near each other for mutual help and protection against common foes. Dimini is only 30 minutes distant from Sesklo. Around Drachmani at least two neolithic settlements were discovered and excavated by Professor Soteriades. The mound of Chaeronea, Magoula Balomenou, is only a little over an hour's walk from Orchomenus, and in the vicinity of Saloniki eight settlements are known.

The remains found in Agios Mamas by the British excavators correspond with our Stone Age finds,[4] proving that the same tribe, possibly different families of the same tribe, occupied the two settlements.

When the Olynthus settlement was established is not easily ascertained and will be discussed in the closing section of our study. It is enough to state at present that the neolithic inhabi-

[4] I express my appreciation and thanks to Mr. Heurtley, Assistant Director of the British School at Athens, who kindly gave me the information and allowed me to mention it in this monograph.

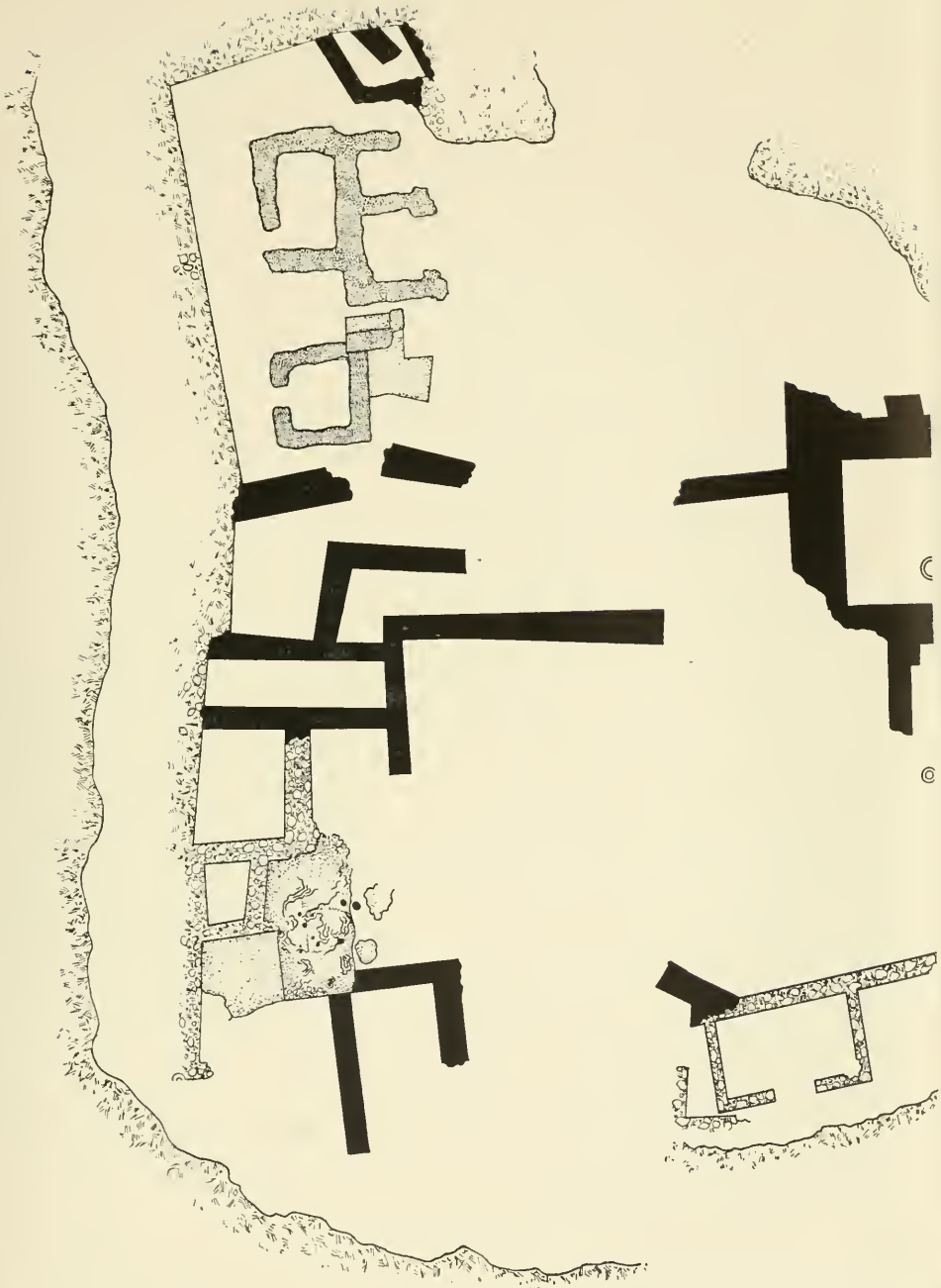
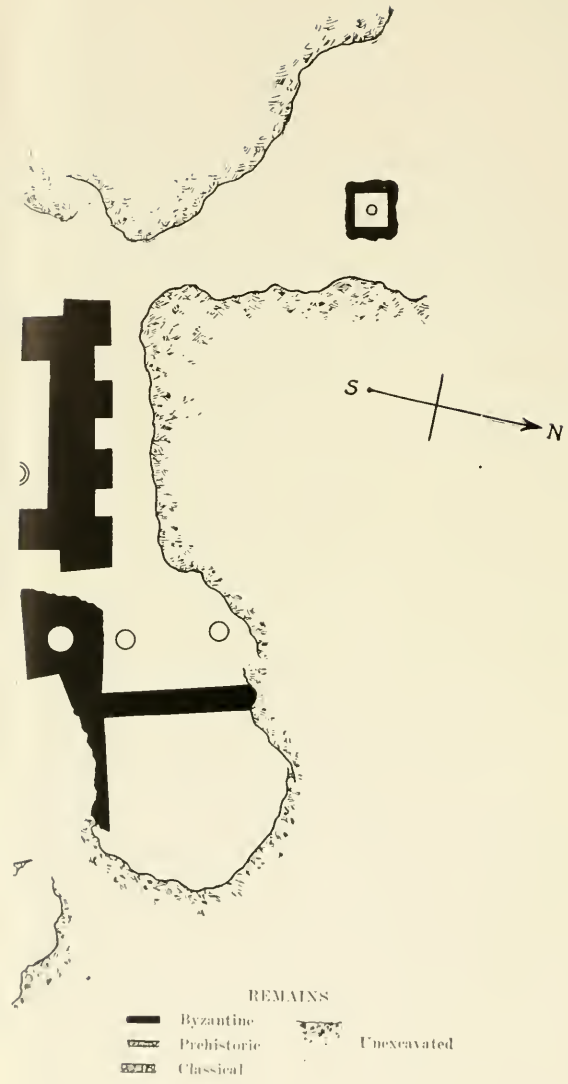


Fig. 3. General plan of the southern projec



tion of the Megali Toumba.

tants of Olynthus were established in their settlement by the beginning of the third millennium B. C.

B. STRATIFICATION AND GENERAL HISTORY.

Two trial pits, A and B,[5] and three broad trenches, Nos. 1-3, were dug and towards the close of the excavation the whole area between the pits and the trenches was completely cleared. In general the finds discovered in the trenches correspond to those found in the trial pits.

Trial pit A was sunk in the middle of the hill and disclosed an undisturbed neolithic deposit. Trial pit B was sunk on the southwestern side of the area and disclosed walls of neolithic houses and an undisturbed neolithic deposit. Trench No. 1, dug from west to east, disclosed a partly undisturbed area and a section partly disturbed by the walls of the Byzantine tower. Trench No. 2, dug from east to west, disclosed a much disturbed area with Classical and Byzantine walls built directly over the prehistoric filling. Trench No. 3, dug from north to south, disclosed an area disturbed by the walls of the Byzantine tower. Thus the pits and trenches proved that the Stone Age remains were very much disturbed on the eastern side of the hill, less so at places in the center, and practically undisturbed on the southwestern side of the mound.

In the center of the hill and a little to the southwest of it, trial pit A, 1.50 m. square, was dug in layers of 50 cm. and showed that the filling about 2.00 m. deep was made of two layers. The one, 40-50 cm., belonged to the Byzantine period and the other, with an average depth of 1.50 m., to the Stone Age.

A second trial pit, B, two meters square, was sunk on the extreme southwestern side of the hill and was cleared in layers of 30 cm. This second pit confirmed the evidence obtained in pit A and gave the following stratification (Fig. 4).[6]

[5] Trial pit A was sunk under the supervision of Professor Robinson by Dr. Clark Hopkins of Yale University, to whom I am grateful for permission to use his notes and results in this paper.

[6] The levels are numbered from the bottom of the pit upwards.

Byzantine Stratum; 0 to 50 cm.

Immediately below the surface fragments of Byzantine pottery were found, increasing in number after 20 cm. were passed. With them were found iron hooks, nails, and Byzantine coins. Two pieces of hand-made black pottery, characteristic of the lower levels, were also found in this layer. 45-50 cm. below the surface a hard level was found made of broken tile and brick and loose stone. The brick and tile, as shown by their size, fabric and method of baking as well as by a small piece with Byzantine letters and ornaments clearly belong to a Byzantine building.

III. level; 50 cm. to 80 cm.

Between 50-80 cm. no Byzantine remains were found, but the filling was softer and composed of earth of a dark brown hue. Twenty-seven pieces of hand-made pottery were found at a depth of 50-65 cm. and included a few pieces of incised ware. Their number kept increasing as the pit was dug deeper. At 75 cm. below the surface the filling was still of soft earth, but it was more powdery. Instead of the dark brown color it had an ash-grey hue, as if it was burnt. At approximately 80 cm. below the surface a level was disclosed harder than the filling. This hard level covered the whole width of the pit, contained many small pieces of carbonized twigs and was all blackened as if much burnt by fire. The burnt level, at a depth of approximately 80 cm., could clearly be seen on the side of the trenches and at other points of the hill, where the stratification was more or less intact. The filling between the brick layer (ca. 45-50 cm. below the surface) and the burnt layer (ca. 80 cm. below the surface) was characterized by fragments of hand-made rough and fine pottery, monochrome, incised and a little painted ware. The fine ware found in this stratum includes a few fragments of red, reddish and brown burnished ware, but mostly finely polished black ware of an excellent fabric. No metal was found but there came to light stone celts mostly of a type unknown to the mainland of Greece and peculiar to the settlement of Olynthus.

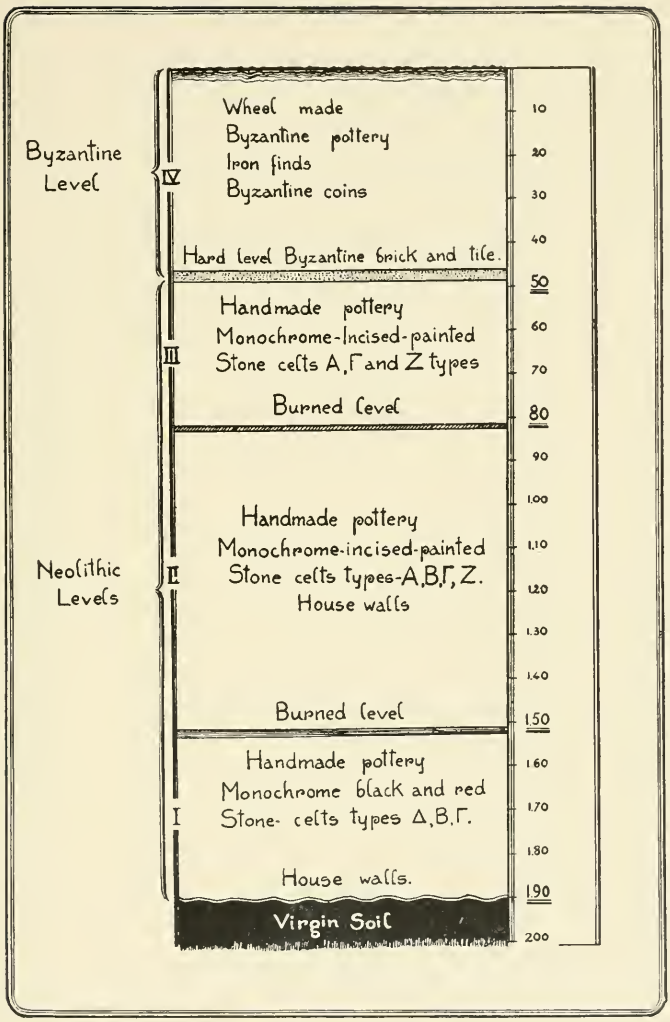


Fig. 4. Diagram of the stratification of the Neolithic Settlement at Olynthus.

II. level; 80 cm. to 1.50 m.

Below the hard level which marks the end of the third stratum the filling was again of a dark brown soft earth to a depth of 1.50 m., where a level composed of brown-yellowish beaten earth and small round pebbles bearing distinct signs of fire and containing many small pieces of carbonized twigs was found. The finds from this stratum include more fragments of hand-made pottery, monochrome, incised and painted ware, similar to that discovered in level III., many bones of small animals, such as sheep and oxen, sea-shells, sharp tools made of bones and stone celts. Remains of walls of houses were also found rising a little over the level of this stratum. No metal whatever was discovered.

I. level; 1.50 to hard-pan level 1.90-2.00 m.

The filling of this stratum down to the natural rock was a little harder than that of level II but it had the same brownish hue. It was full of fragments of rough and fine, burnished, red and black pottery. No painted or incised ware was discovered in this lowest stratum. Bones of small animals used as pins, sea-shells and many celts of a small size were found but no trace of metal. The surface of the conglomerate bore signs of burning and on it pieces of carbonized twigs were abundant.

If we take the discovery of metal as our dividing factor, the whole filling of an average depth of 1.90 m. will be divided into two main zones. The first zone extends from the surface of the hill to a depth of 45-50 cm. and in it iron was found. The second zone extends from 50 cm. below surface to natural rock. It has an average depth of 1.40 m. and in it no metal was discovered. The first zone is characterized by Byzantine finds and perhaps belongs to the 11th century A. D. The second is characterized by hand-made ware and stone tools. The absence of metal and the presence of stone tools place the second zone in the Stone Age. The character of the finds proves that the second zone belongs to the Neolithic Period.

The neolithic filling is quite deep (1.50 m. at places) and it required a long time to be formed. The neolithic settlement there-

fore had a long existence. The discovery of three different floor levels bearing signs of a great conflagration reveals three different stages in the history of the settlement. The similarity of the finds in the neolithic strata prove that the same tribes occupied the site all the time. They built the first settlement over the hard rock. After a long time this village was destroyed either by an accidental conflagration or by the fire of an enemy. On the levelled remains of the first settlement the descendants of the original settlers built a second village, which again was destroyed by fire. A third settlement was built on the ruins of the second. This again was destroyed by fire, never to be rebuilt. After the last destruction the site remained unoccupied for many centuries, until the Historical and Byzantine times, when houses and the big tower were built directly over the neolithic settlement.

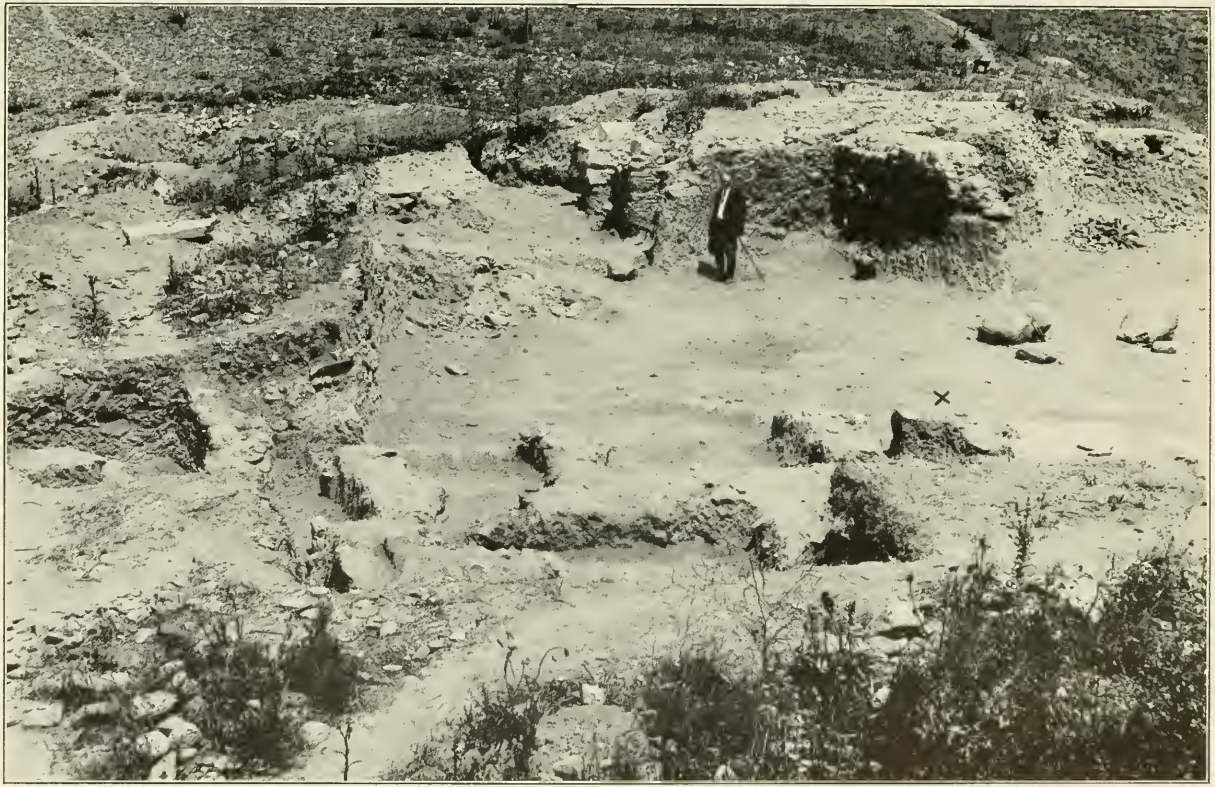


FIG. 5. Remains of Neolithic Houses. The letter "x" marks the remains belonging to the third neolithic village.

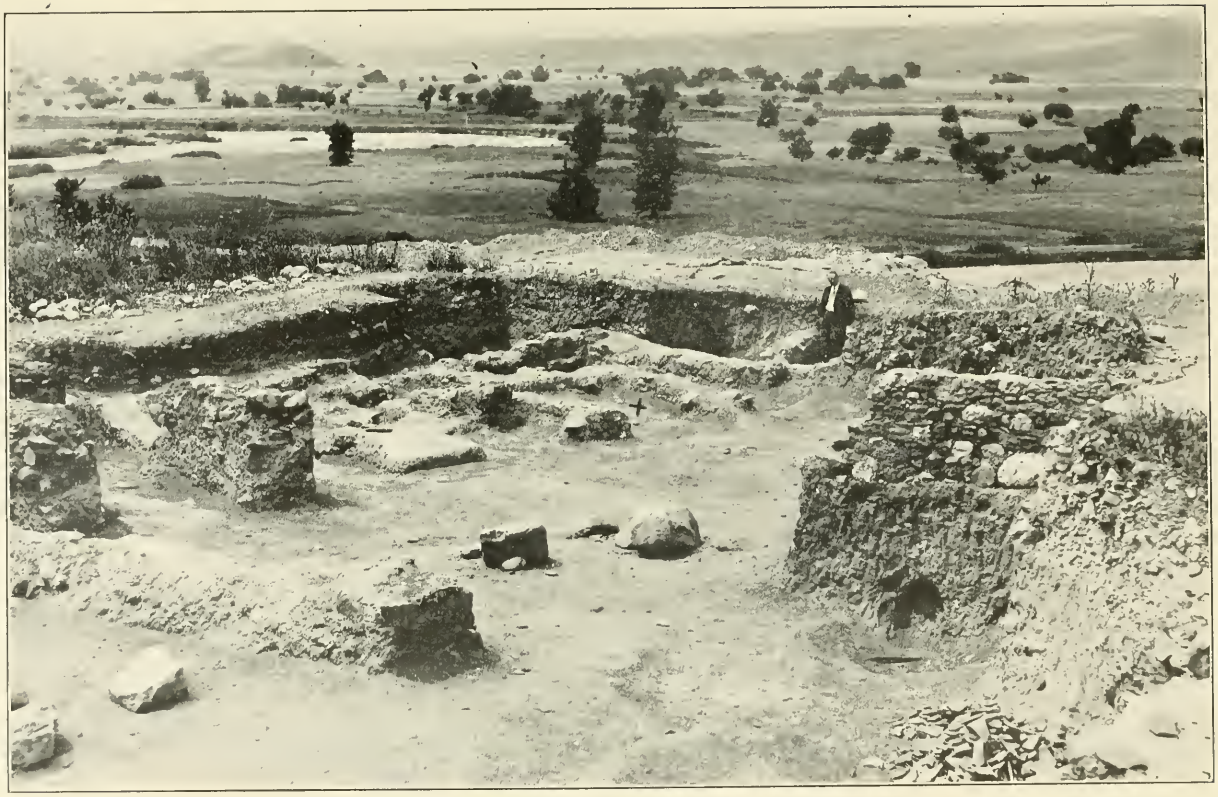


FIG. 6. Remains of Neolithic Houses (marked by letter "x") from the north.

CHAPTER II

ARCHITECTURAL REMAINS

A. HOUSES

The stratification and the ceramic and stone remains at certain places were not so much injured by the buildings of the Classical and Byzantine times, but the architectural remains were badly damaged. The Classical and Byzantine masons paid very little attention to where they laid their walls and naturally destroyed the small unpretentious buildings which belonged to the first settlers of the hill. In spite of their fragmentary condition, however, enough architectural remains are preserved to give us an idea of the plan of the houses of the settlement at Olynthus.

In trial pit A and in neolithic layers a primitive wall was disclosed made of river stones laid in mud and preserved in two courses. It extended for 1.50 m. from east to west. This wall was the foundation on which in all probability the corner of a hut stood. In pit B and at a depth of 1.30 m. below the surface, at practically the same level in which the first wall was found, other architectural remains belonging to neolithic houses were brought to light.

It was very difficult to clear these remains, as they were preserved in a very fragmentary condition because of the material with which they were constructed (Figs. 5-6). Scanty as they are they belong to the three stages of the settlement. The oldest remains, discovered under the second hard floor, which formed the upper limit of the lowest stratum, give us the plan of a building of the earliest stage of the settlement.

They belong to a small quadrangular building, House A, laid directly on the hard conglomerate of which the hill is composed (Fig. 7). The walls of House A are built of small unworked rough river stones laid at random in mud and they present a more or less irregular outward face. They are preserved in three courses, ris-

ing to almost 20 cm. above the rock level. Their width averages 80 cm. and the size of the stones used in their construction is very small, not exceeding 10 cm. in length and 7 cm. in width and thickness. Evidently the neolithic inhabitants of the site suffered from the lack of stone material in the same way as the historical builders of Olynthus. The conglomerate, of which the hill is formed, is hardly good enough for any building operations. To this cause is due the lack of extensive and more substantial architectural remains and the fragmentary preservation of those discovered.

The longer wall of the house runs from east to west and measures in its greatest length 4.35 m. The sides north to south are not perpendicular to the first east to west wall, but narrow upwards, thus giving to the building a trapezoidal shape. They measure 2.90 m. in length and their varying thickness averages 80 cm. The fourth side of the building, running east to west, due to the turning in of the side walls, is only 3.10 m. in length. In the middle of this side a small opening measuring 75 cm. was discovered, which evidently formed the entrance to the house from the south. No signs of wooden beams in the walls were apparent and evidently no wooden supports in the building of the walls were used. On these wide walls rested the superstructure of the house. Of this nothing is now preserved and we cannot with certainty prove whether it was made of stone, wood or sun-dried brick. If the upper parts of the house were made of wood, of branches of trees and poles placed near each other and covered with a thick layer of plaster,[1] we ought to find the carbonized remains of the wooden poles or branches in the filling. Very little of such carbonized wood was discovered, and this could not be considered as forming the superstructure of the house. We may with certainty exclude the possibility of its being constructed of stone. Stone was very scarce and in the filling very little of it was discovered, an indication that the superstructure was not made of that material. I am inclined therefore to think that it was of sun-dried bricks. No mud plaster was used to cover the walls since no trace of it was

[1] Huts built in this way were found at Seklo by Prof. Tsountas, cf. *op. cit.*, pp. 79 ff., and Figs. 13-17.

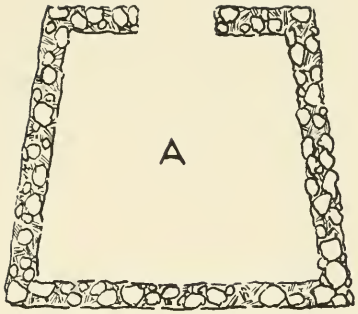


Fig. 7. Plan of House A; first neolithic village.

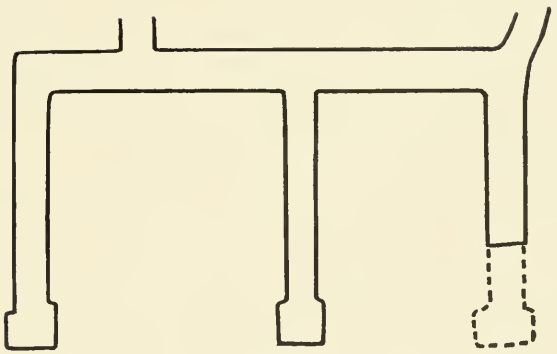


Fig. 8. Restored plan of House B; second neolithic village.

discovered.[2] The great width of the walls strengthens this view. We are in no position to know the shape of the roof and no remains of plaster are preserved to give us a clue. We can only say with probability that it was made of twigs, branches and reeds, carbonized remains of which were discovered in the filling of this stratum. The hard surface of the conglomerate roughly flattened served as a floor to the hut. No sign of a fixed hearth was discovered in the house.

Second Stratum.

In the second stratum, belonging to the second period of the neolithic settlement of Olynthus, were discovered numerous architectural remains, which unfortunately are very fragmentary and can tell us nothing beyond the general shape of the buildings. These remains were discovered in the trial pit B and Trench No. 1 dug in the west side of the hill. To this stratum also belongs the wall discovered in pit A.

The walls of this period differ a little from those described above in that they are not laid on the conglomerate. They are either laid on the hard surface of the levelled ruins of the first settlement or on a small foundation sunk down through the surface of the levelled filling to the natural rock. The foundation is made of very small stones, pebbles, pieces of broken rough pottery and pieces of quartz, and goes down 40-45 cm. through the filling to the bed rock. On this foundation flat and rounded river stones of good dimensions, ca. 25 cm. long, are regularly placed and are preserved at places to the height of two courses. They form walls crossing each other in quadrangular or trapezoidal forms. The walls discovered belong to two distinct buildings.

[2] Usually small pieces of plaster are preserved and when the building which they cover was destroyed by fire, they are baked hard and bear the impressions of the reeds and wooden poles on which they rested. Such pieces of plaster were discovered by Prof. Tsountas in Sesklo (Tsountas, *loc. cit.*) and by Prof. C. W. Blegen in Zygouries. Cf. Carl W. Blegen, *Zygouries, A Prehistoric Settlement in the Valley of Cleonae*, Harvard University Press, 1928, hereafter to be referred to as Blegen, *Zygouries*, p. 13 and Fig. 12. The Zygouries finds go back to the Early Helladic period and belong to the roof of the huts.

House B. The plan of this house is not clear, but evidently the building is quadrangular in shape and was composed of at least two rooms. The walls of the building, preserved to a height of c. 25 cm., are of uneven thickness. The long horizontal wall, evidently the back wall of the house, runs from east to west and has an average thickness of 95 cm. The two perpendicular outside walls have an average thickness of 75 cm. and the perpendicular central wall has an average thickness of only 45 cm. We may with certainty take the thicker walls to be the outside walls of the house, and the central perpendicular one to be a cross wall dividing the building into two sections or rooms. Room I, as preserved, measures 2.40 x 2.40 m. (inner dimensions) and room II measures 1.50 x 1.40 m. (inner dimensions and to the preserved end of the western wall). The northern part of the building and a part of the west side are missing. No signs of doorways were discovered nor an opening between rooms 1 and 2. At the north end of the cross wall a few flat stones were found on the level of the floor of the house. On the existing north end of the eastern outer wall on the same floor level and practically on the same line with the flat stones at the end of the cross wall, other flat stones were found. They most probably mark the one end of the opening of the main doorway of the house and corresponding stones must be placed a small distance to the north. The ground plan of the building can be restored as in Figure 9.

The flat stones at the end of the eastern outer wall and of the cross wall also may be considered as the foundations on which were built rude mud brick pilasters, which supported the roof of the building.[3] In that case house B is composed of two sections or rooms open to the north as shown in Figure 8. These two sections formed one house, as is proved by the thinness of the central perpendicular wall, which evidently is a cross wall, and by the small dimensions of the second room. The opening of the rooms could be closed by hides suspended from the roof.

Abutting on the south wall of house B house C was discovered, measuring 3.20 m. in length and 1.80 m. in average width (inner

[3] I am grateful to Dr. L. B. Holland for this suggestion.

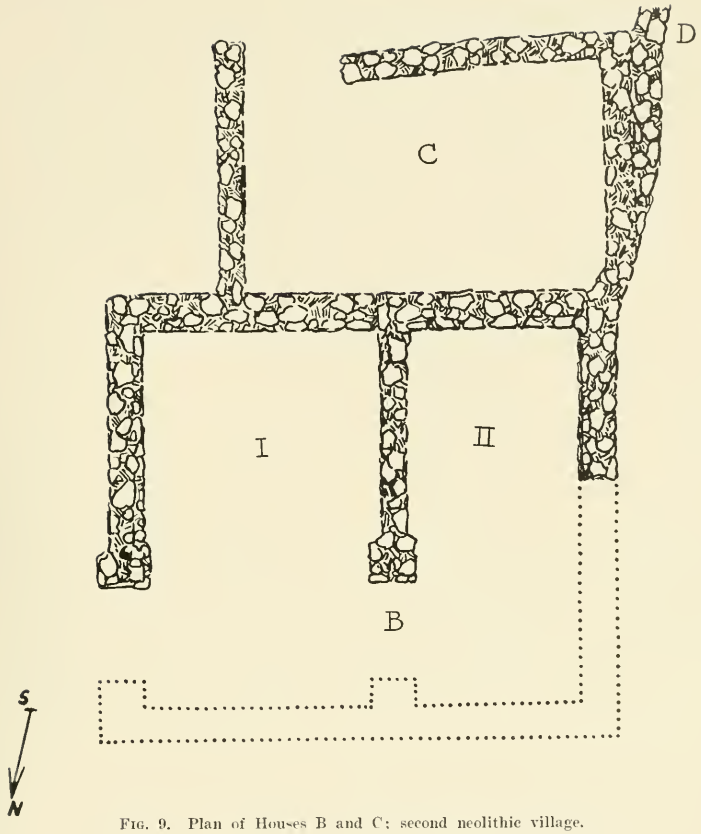


Fig. 9. Plan of Houses B and C; second neolithic village.

dimensions). It is quadrangular in shape and is composed of one room (Fig. 9). Its walls, besides the one belonging to house B, the average thickness of which was 95 cm., have an average thickness of 60 cm. The entrance is on its southern side and measures 65 cm. No threshold or door jambs were discovered. Against its west wall abuts the wall of another house D, the surviving remains of which were ruined by the building of the outside wall of the Byzantine tower. This characteristic of a common wall between two houses is not unique in Prehistoric Architecture.[4] No signs of wooden beams in the construction of the walls were discovered and evidently they were not yet in use. The entrances seem to have been mere openings in the walls and most probably were closed by hides of animals. The floor of these houses was of beaten earth, with occasional small river pebbles. As to the shape of the roof we can say nothing definite, since no evidence whatever is preserved, but we may presume that they also, like those of the previous settlement, were made of twigs and branches of trees.

Third Stratum

The only architectural remains discovered in this stratum are the corner of a building which was built over houses A, B and C of the lower strata (Fig. 5). The walls meet each other at right angles and thus indicate that the shape of this house also was rectangular. The thickness of the walls, which are made of rough flat river stones, is 50 cm. They are preserved to a length of about 50 cm. on either end.

General Conclusions

The huts of the neolithic settlement of Olynthus had a quadrangular shape and were composed of one or two rooms. They were built of sun-dried brick which rested on a low thick wall built of small unworked river stones. The floor of the houses was of

[4] For Thessaly see Tsountas, Fig. 18; the so-called double Megaron of Sesklo. Party walls were in use during the Early Helladic Period at Zygouries (Blegen, *Zygouries*, p. 6, Fig. 9).

beaten earth containing small pebbles. The walls were not covered with plaster and the roof, of unknown shape, was made of branches of trees and reeds. No wooden beams were used in the construction and the entrances were mere openings in the walls. The houses were built near each other and very often next to each other with one common wall. The huts of the different layers present the same characteristic principles of construction and prove that their builders belonged to the same tribe. Their destruction was due either to accidental fires or to the quarrels with the neighboring inhabitants of the Mound of Agios Mamas, who raided the settlement.

B. POTTER'S KILN

At the extreme southeastern end of the neolithic settlement one of the most interesting discoveries of the excavations was made. By the side of the lowest course of a Byzantine wall, measuring 50 cm. in width, running north to south, a deep layer of soot and burned earth was revealed. Careful clearing led to the discovery of an oval hole, 35 x 15 cm., full of charred wood and ashes (Fig. 10, A1). The top of this hole was covered by the round bottom of a cooking pot made of rough clay, 18 cm. in diameter. When cleared the hole proved to have a depth of about 20 cm. It was narrower at the bottom than at the top and its sides were very much hardened by fire, with the exception of two places, in one case under a piece of a flat stone, where they were very soft. Further examination revealed two round openings of about 8 cm. in diameter where the soft places on the sides of the hole were observed. In the most easterly opening, the one under the flat stone, carbonized remains of a wooden beam were discovered. The other opening was full of black soot and formed the beginning of a channel leading south.

Hoping to find the house to which the structure belonged, we cleared the Byzantine wall carefully. Under it a large oval area (Fig. 11 B), 1.10 x 70 cm., with a straight southern side, was disclosed. It had an ashy red surface, which looked as if it had been intensely heated and turned into brick. When rubbed against pick

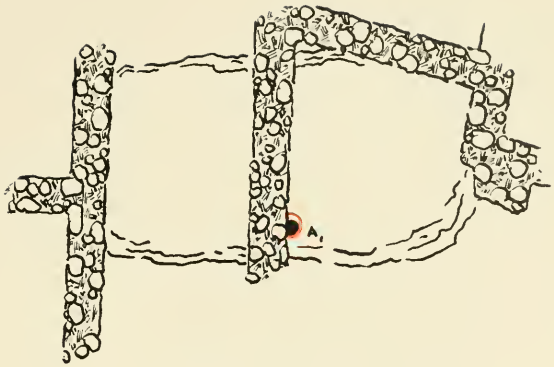


Fig. 10. Byzantine Wall and Fireplace A_1.

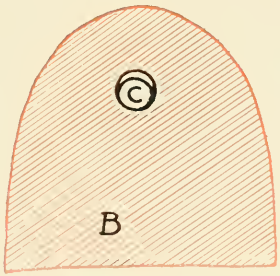


Fig. 11. Plan of the red oval area (or floor of kiln).

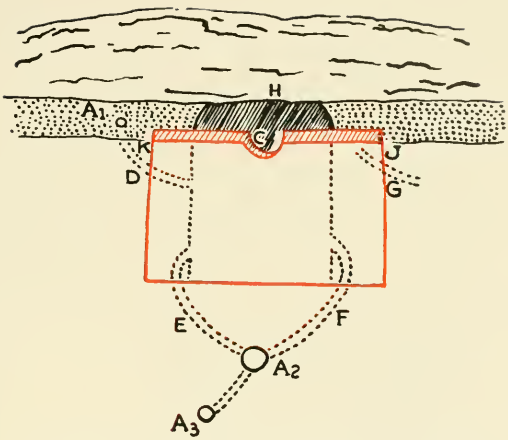


FIG. 12. Plan of the red basin; fireplaces A_1, A_2, A_3 and channels D, E, F, G; perpendicular cut J–K along the depression C. /// soft filling. ·:·:· hard rock.

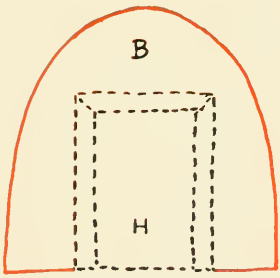


FIG. 13. Position of soft filling H (fireplace) under the red basin B (floor of the kiln).

or finger it crumbled like overbaked brick. The surface of this red basin was uneven, sloping downward from the sides to the center. Towards its north end and a little beyond its center was found a depression (Fig. 11 C) 7.5 cm. in diameter. The sides of the depression were baked hard and varied in color. Towards the surface of the red basin they were of a smoked red color, a little lower they were of an ashy grey color and towards the bottom, where a thick layer of ashes was found, they were black. The depth of this depression was 35 cm. from the sunken center of the red basin.

Beyond the red basin to the south and the southeast two more holes, resembling two fire places, were discovered (Fig. 12, A2, A3). They had a round shape and they measured about 35 x 30 cm. Their sides were baked hard, excepting at places, which when cleared revealed openings about 8 cm. in diameter. These marked the beginning of channels which led under the side of the red basin. Four such channels, D, E, F, G (Fig. 12), with an opening of about 8 cm., were disclosed. They were found full of soot and their hard baked sides were full of smoke. In general they presented the same appearance as that of the chimney of a modern fireplace before it is cleaned. Their lower surface was about 35 cm. below the level of the red basin, thus corresponding to the greatest depth of depression C.

A perpendicular cut made a little beyond the center of the red area (Fig. 12, J-K) revealed the red level to be 5-8 cm. in thickness. Its lower part included carbonized remains of twigs. Below it the filling of a black ashy color was soft and full of ashes and carbonized remains of wood and figs (Fig. 12 H). This soft filling was not found under the whole of the red basin, but it filled a quadrangular space (Figs. 12-13 H), which began from the southern straight side of the red basin and ended a little beyond the well-like depression C. The length of this area was 70 cm. and its width 55 cm. The end of channels D, E, F was found on the inside face of this quadrangular area, proving that the channels led indeed under the red basin (Fig. 14).

The carbonized remains of a beam (Fig. 15 L1) were found filling

one of the channels discovered in the oval hole A1. This beam, about 10 cm. in diameter, placed on hard ground, ran along the northern side of the red basin and was set perpendicularly on another beam (Fig. 15 L2), which ran along the eastern side of the same basin. Enough evidence was obtained (Fig. 15 L1, L2, L3) to show that along at least three of the sides of the red basin there were beams. Apparently these beams formed a frame on which the red basin rested (Fig. 15). We may again point out that the ground under the central part of the red basin was soft and full of carbonized matter, while that under the beams, especially on the northern side, was very hard and contained no carbonized remains. On the eastern and western sides the channels D, E, F passed under the beams. The ground between the beams and the upper part of the channel was almost 10 cm. in thickness and was very hard. On the fourth, or southern side, no wooden beam was found.

The purpose of the red basin, with channels on two sides leading under its surface (Fig. 16), is apparent. The great quantity of carbonized earth and ashes found all around it indicates that this basin was heated repeatedly and intensely. Such heating can be expected in a potter's kiln. That ours is a small kiln is certain. The red basin (B) is the floor of the kiln. Its color and texture present the same appearance as the floor of modern kilns, where the fire is not built in the floor of the oven itself. The lack of black patches on the surface proves that the heating was not effected by a fire built on the same area, but came from an outside source. The quadrangular space under the red basin (H) is the fireplace of the kiln, while the channels around it regulated the draught which fed the fire. The small capacity of the kiln was enough for a few vases at a time. The Byzantine wall built directly over it ruined the upper part of the oven. The weight of this wall also proved too much for the floor of the kiln, so its center collapsed and fell into the opening of the fireplace. This explains the uneven surface of the floor and the apparent lack of the fireplace. The edges of the floor placed on the beams remained in their original level and they give us the height of the fireplace. From the lower

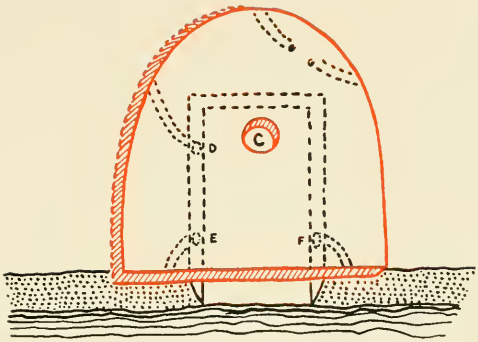


FIG. 14. Plan showing ends of channels D, E, F on the inside face of walls of fireplace.

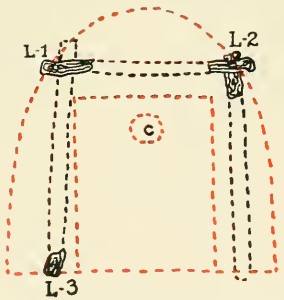


FIG. 15. Position of beams L_1, L_2, L_3 around the fireplace.

part of the extreme end of the red basin to the floor of the channel it is 30 cm. As the channels could not lead to the bottom of the fireplace, but more probably to a point a little over its center, the height of the fireplace must be considerably larger than the distance from the lower part of the red basin to the floor of the channels. It must therefore have been at least 50 cm. in height. The well-like depression C in the red basin was the hole through which the heat came from the fireplace into the kiln. No complete vases were discovered, but the great quantity of sherds found all over the red basin and around it proves that the kiln belongs to the neolithic period and as such it is the earliest kiln discovered in Greece.

Using the evidence disclosed by the excavations, we shall try to see how the kiln was built and how it was operated.[5] A large area was cleared and a quadrangular hole of about 70 x 55 cm. was dug in the conglomerate rock to a considerable depth. A wooden cradle made of twigs and beams, three beams forming the sides of the cradle, was placed over the hole and rested on the hard ground. Then the cradle was covered with a thick layer of clay, with the exception of a small hole 7.5 cm. in diameter left at the one end. This wood and clay construction formed the floor of the kiln, while the quadrangular space underneath it was the fireplace. Through the hole in the floor the heat and flames could enter into the kiln. From the fireplace channels were started, which led to holes or fireplaces outside the area of the kiln. By closing or opening one of the channels the potter could regulate the intensity of the fire. After the channels were made and the cradle was placed over the fireplace, a big fire was built which burned the wooden cradle, but which at the same time baked the clay over it hard and formed a solid floor. The part of the floor over the fireplace is so small that it needed no supports and could be made straight. The opening of the fireplace was not found, but evidently it was under the straight south side of the floor of the kiln. There the ground was baked hard and was blackened by the smoke and flames. A great amount of ashes and carbonized remains of wood and figs were

[5] I want to express my thanks to Prof. A. Arvanitopoulos of the University of Athens, Greece, and to Mr. R. S. Darbishire for their many valuable suggestions.

also found there, showing the position of the opening of the fireplace. The part of the kiln over its floor was destroyed and no evidence whatever was found to suggest a restoration. However, the lack of traces of the opening of the kiln and the lack of the joint of the walls of the kiln on its smooth floor indicate that the cover of the oven was not permanent. It evidently was a temporary cover, of branches and leaves plastered over with mud, built over the floor when the kiln was to be used (Fig. 17). In that respect the kiln discovered at Olynthus differs from that discovered by Dr. László in Erösd.[6]

It is worth repeating that over the opening of each of the holes at the end of the channels the base of a rough cooking pot was discovered. We may therefore presume that the holes (A1, A2, A3, Fig. 16) were also used as stoves. It is possible, however, that the rough pots were placed there to stop the draught and so keep the heat in the fireplace. This would mean that the kiln was not in use when it was destroyed and would also explain the failure to find complete vases on its floor. It is interesting to note that today the chimney openings of modern kilns in Greece, when the kiln is not working, are covered with big rough kitchen pots so that their floor will not be cooled. We may also notice that the channel G (Fig. 12) is running in a different direction from the others and evidently its opening is under the Byzantine wall still in situ to the east. At the end of this channel the lower part of a cooking pot turned upside down was found and under it the carbonized remains of grain were discovered. Does this indicate the running away of the cook caused by the sudden arrival of the foe who captured the village, destroyed the houses and put an end to the settlement?

The form and the construction of the Olynthian kiln is both elaborate and perfect. It testifies to the great knowledge of the potter in using draughts and fire for the baking of vases. It enables us to see through what means the potter succeeded in getting his perfect fabric. It has been suggested that this structure

[6] Cf. F. László, *Fouilles à la station primitive de Erösd* (1907-1912), 1914, pp. 397-398 and Figs. 18-20.

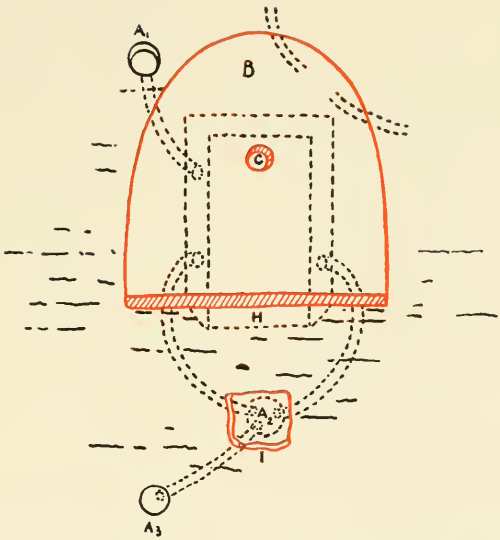


Fig. 16. Plan of the floor (B), fireplace (H), and channels of the Olynthian kiln.

Fig. 17. Restoration of the Olynthian kiln.

is not a kiln, but part of the roof of a building which collapsed and burned slowly after the building was destroyed. In this case the existence of well-formed channels, of the holes to which the channels led and of the red basin is unexplainable. It would be strange that the frame composed of wood fell on hard ground, while the center fell over a hole dug in the conglomerate and filled with ashes and carbonized matter. Our small structure, without doubt, is a kiln, which was first ruined by the raiders of the settlement and then damaged by the Byzantine builders. The preserved scanty remains (Fig. 18) are enough to enable us to restore the kiln. Complete vases were not found in it. This was unfortunate, but can only prove that the kiln was not in use at the time of the destruction. This view is strengthened by the discovery of the kitchen pots at the end of the channels.

The importance of this find is self-evident when we note that it is the earliest kiln discovered in Greece. Professor Tsountas found small areas lined with tiles in Dimini and Sesklo.[7] He calls these areas "ἱπνούς" or ovens, but no fireplace or elaborate system of channels was discovered there to prove that the structures revealed were real ovens, and especially potter's kilns. Mr. Heurtley in his excavations at the mound of Agios Mamas in 1928 discovered a potter's kiln, but it has no fireplace and it belongs to the Helladic Period.[8] The kilns known from other places belong to the historic times.[9]

At a small distance from the northern end of the kiln a round hole 80 cm. in diameter, dug in the hard conglomerate, was discovered (Fig. 18 M). It has a depth of 60 cm. and it was found full of ashes, sherds and carbonized matter. Most probably this well-like basin was used by the potter in the preparation of his clay.

It is very interesting to notice the similarities of this neolithic

[7] Four "ἱπνοί" were found in Sesklo and one in Dimini. Cf. Tsountas, p. 52 and Fig. 10, p. 91 and p. 104.

[8] Cf. *J.H.S.*, XLVIII, 1928, p. 186.

[9] Cf. K. A. Rhomaios in *Ath.Mitt.*, XXXIII, 1908, p. 180, "Ein Topferofen bei H. Petros in der Kynuria." Miss Richter's statement, *The Craft of Athenian Pottery*, p. 78, that "no actual Greek kilns have yet been discovered," must be revised.

kiln to the ovens in use at the present time in the villages of Greece. The floor of the modern ovens is made in the same way as the floor of the Olynthian kiln. A wooden cradle is formed, which is covered with a thick layer of clay, leaving small holes here and there. This cradle is placed over a hole, about 50 cm. in depth, which constitutes the fireplace. Then a big fire is started in the fireplace which burns the wooden cradle, but also bakes the clay hard and transforms it into a solid clay floor, with small openings for the heat to get from the fireplace into the kiln. On the floor the brick to be baked is piled and then covered with brushwood and a thick layer of earth, which forms the cover or the vault of the kiln. The fire is started and kept burning for days till the brick is well baked. The vases to be baked are usually placed between rows of brick. The laborers who excavated the neolithic kiln at once recognized it as an oven and told us how the modern kilns in their villages were made. We had a chance to visit such a kiln and we were astounded at its similarity to the prehistoric one at Olynthus.

The discovery of the kiln by Professor Robinson gave us the opportunity to learn that today some of the refugees from Asia Minor have in the floor of their houses deep holes or "bothroi," which present striking similarities to the "bothroi" common in Early Helladic times.[10] The modern "bothroi" are used for heating the houses and for the preparation of food and bread. I have given a detailed description of these *bothroi* in my book "Ἡ νεολιθικὴ ἐποχὴ ἐν Ἑλλάδι" (Athens, 1928), pp. 161 ff. Practically all the houses belonging to the refugees from Nigde in Asia Minor, who have established themselves in the village of Myriophyto, possess such *bothroi*.

[10] Cf. Blegen, *Korakou, A Prehistoric Settlement near Corinth*, p. 75; *Zygouries*, pp. 26, 28, 76, 77, 215; H. Goldman, *Excavations at Eutresis, Fogg Art Museum Notes*, September, 1927, pp. 23 and 30; H. Bulle, *Orchomenos*, I, pp. 27 ff.

Fig. 18. Remains of Potter's Kiln.

SUMMARY OF REMAINDER OF DISSERTATION

Pottery—Figurines—Celts and Smaller Finds.

The Pottery discovered at Olynthus includes Monochrome, Painted and Incised Ware. The characteristic monochrome pottery has a black, shiny surface, caused by a carboniferous pigment placed on the clay before baking. The surface of the vases is very well polished and shined. Usual shapes are bowls with a wide opening and long tongue-like handles called "thumb handles".

Incised sherds appear in the filling of the second neolithic village and belong to three- and four-legged vases of unknown purpose. Most of them are of a very rude workmanship and are improperly baked; but one piece is of an excellent workmanship and the design is made of incised lines forming bands filled with dull red color.

A few painted sherds were discovered in the filling of the second village. They bear a linear and curvilinear design painted in brownish-black paint on the red surface of the vase. One sherd bears a decoration in graffite on a shiny black surface.

Ten figurines were discovered in the settlement. Three are made of marble, four of rough stone, and three of clay. One of the marble figurines is perforated for suspension and one of the clay figurines bears an elaborate incised decoration. We believe that these figurines are representations of the Mother Goddess worshipped by the primitive inhabitants of the village.

Sixty-five more or less complete celts were discovered belonging to the known mainland types of celts and to three types peculiar to the settlement of Olynthus.

Among the small finds are bowls made of marble, pieces of two stone necklaces, grinders, mortars and millstones, whorls and sling bullets made of stone and clay. Very many bone pins and tusks of boars are among the finds, as well as carbonized remains of wheat, millet and figs.

The neolithic remains of Olynthus present important similari-

ties to those found in the southeastern section of Thessaly, in Dikeli Tash, Thrace and the Black Earth region. A comparative study of the known neolithic finds in Macedonia, Troy and the mainland of Greece proved that the Olynthian settlement antedates the central Macedonian culture (as revealed at Vardaroftsa) and Troy I, and that it is contemporary with the second neolithic period of Thessaly. The beginning of the Olynthian settlement therefore must be placed about 3000 B. C. It further proved that the neolithic inhabitants of Olynthus were not Indo-Europeans, but belonged to tribes which occupied the Black Earth region during the neolithic times.

VITA

George E. Mylonas was born in Smyrna, Asia Minor, on December 9, 1898. He completed his undergraduate work in the Evangelical School and the International College of Smyrna. He graduated from the University of Athens, Greece, in 1922 and received the degree of Ph. D. in the same institution in 1927.

He was connected with the American School of Classical Studies at Athens from 1925 to 1928 and during these years he followed courses given by the Greek Archaeological Society and the Foreign Archaeological Schools at Athens. He visited all the archaeological sites of Greece and made special studies of the remains of Crete, Tiryns, Mycenae, Thessaly and Athens. He lectured on Prehistoric Archaeology for the American School in 1927-28. He followed the excavations at Corinth, Nemea and the Argive Heraeum and in 1928 assisted Professor David M. Robinson in his excavations at Olynthus. He worked in the National Museum at Athens and in the Saloniki Museum from May to September, 1928, repairing and studying the prehistoric finds of Olynthus.

He was registered at the Johns Hopkins University in October, 1928, and enjoyed the Charles A. W. Vogeler Fellowship in Archaeology for the year 1928-29. He followed courses in Archaeology, Greek, Latin and History given by Professors D. M. Robinson, C. W. E. Miller, Tenney Frank and W. P. Mustard. The subject of his dissertation was suggested to him at Olynthus and for this suggestion and the permission to study and publish the first neolithic material discovered in the Chalcidice and for the valuable advice and guidance he received during his stay in Baltimore the writer is greatly indebted to Professor David M. Robinson. He wants to express his gratitude also to Professors Robinson, Miller, Frank and Mustard for the privilege he enjoyed of attending their courses and for the valuable knowledge he gained from them.

In 1928 he published a book in modern Greek entitled "The Neolithic Age in Greece" and was one of the lecturers of the Archaeological Institute of America for the year 1928-1929.

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